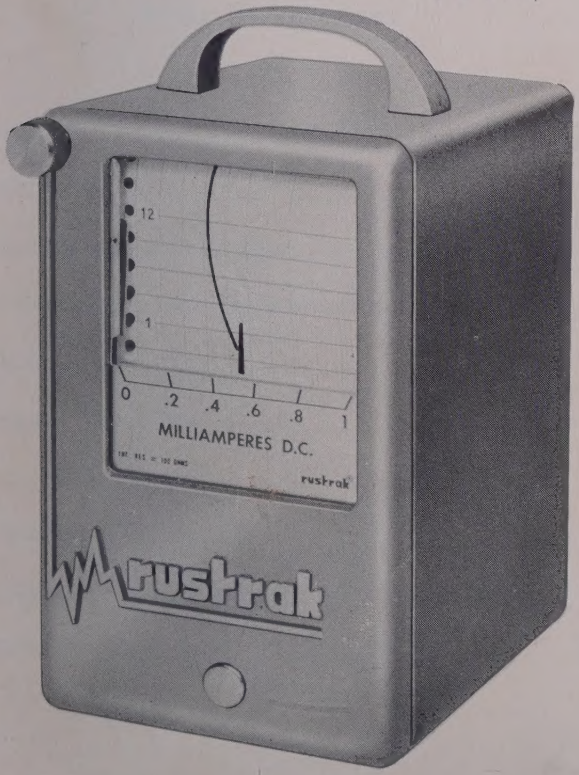
RUSTRAK 5 ma DC

MINIATURIZED AUTOMATIC CHART RECORDER

Model # A S# 10141



OPERATING INSTRUCTIONS

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WARRANTY

Rust Industrial Co., Inc. warrants each instrument of its manufacture to be free from defects in material and workmanship. Our obligation under this warranty is limited to replacing any part(s) which shall, upon examination by our factory, be determined to have been defective.

OPERATING INSTRUCTIONS

RUSTRAK

MINIATURIZED AUTOMATIC CHART RECORDER

1. DESCRIPTION

a. This miniaturized automatic chart recorder indicates the magnitude of applied currents or voltages by recording a continuous, distortion-free line on pressure-sensitive paper. The instrument is 5-5/8 in. high, 3-5/8 in. wide, by 4-1/8 in. deep, and weighs 3-1/2 pounds when loaded with a full spool of recording paper. It may be used as either a portable or a rack-mounted instrument. RETMA standard panels, for mounting 2, 3, or 4 recorders, are available as stock items at nominal cost.

b. The Rustrak recorder may also be used as an indicating instrument, with its galvanometer stylus functioning as a meter pointer on its calibrated scale. Standard instruments have an accuracy of 2% of the full-scale reading. Recorders with an accuracy of 1% of the full-scale reading are available on special order.

2. PRINCIPLES OF OPERATION

a. The applied signal is coupled to a galvanometer which (in the standard instrument) has a sensitivity of 1 ma at full-scale deflection, with an internal resistance of 100 ohms. A stylus records amplitude of the applied signal. The stylus is pressed against the chart paper at a rate dependent upon the motor speed employed. With proper selection of a motor and gear train, the recording paper will move at speeds from as slow as 1 inch per day to as fast as 240 inches per hour. The number of strikes that the stylus will make on the recording paper can be as slow as 75 strikes per day to as rapid as 4 strikes per second. In the standard instrument, a 2-rpm motor is used with a particular gear train to produce a stylus writing speed of 1 strike every two seconds. Because of the comparatively rapid succession of dots impressed on the pressure-sensitive paper by the stylus, a continuous trace is obtained without the use of ink, electric current, or heated stylus. Therefore, the Rustrak can be used under high humidity conditions and over large temperature ranges.

b. The standard instrument employs a moving coil galvanometer for direct current measurements. For all a-c measurements, bridge type rectifiers are used, thereby assuring linearity over the entire recording range.

c. The movement of the paper within the recorder is controlled by a drive drum, as shown in

figure 1. This drive drum is coupled to the motor by a gear train. Sprockets on the drive drum assure positive movement of the recording paper, which is automatically rolled onto a take-up (or reroll) spool. A brake, applying pressure to the supply roll, prevents free unrolling of the recording paper.

3. PREPARING A NEW INSTRUMENT FOR USE

Note

All parts of the recorder are precision-fitted. Never use force on any parts, when preparing the instrument for operation.

a. UNPACKING. Unpack the recorder and its accessories with care. The following accessories are supplied within the corrugated shipping carton:

(1) One roll of chart paper.

(2) One connecting plug.

(3) One chart reader (consisting of a calibrated scale identical to that mounted on the instrument panel).

(4) One instruction booklet.

(5) One handle and four rubber feet, with hardware (for portable instrument application); or one set of mounting hardware with mounting template,

(for rack-mounting application). Conversion from a portable instrument to a panel-mounted instrument, or vice versa, can be accomplished by ordering an alternate set of hardware.

b. LOADING CHART PAPER.

Note

Disconnect operating power from the instrument, when loading.

(1) Loosen the knurled thumb screw, at the upper left corner of the panel, and open the panel.

(2) Referring to figure 1, push the two retaining clips up and remove both the empty supply spool and the take-up spool from their slots.

(3) Place a new roll of chart paper on the supply roll so that the perforations in the paper are adjacent to the roller's knurled shoulder.

(4) Remove the masking tape from the roll of paper. Save the masking tape for later use.

(5) Roll out approximately 8 inches of paper from the supply roll with the back (dark) side of the paper facing you.

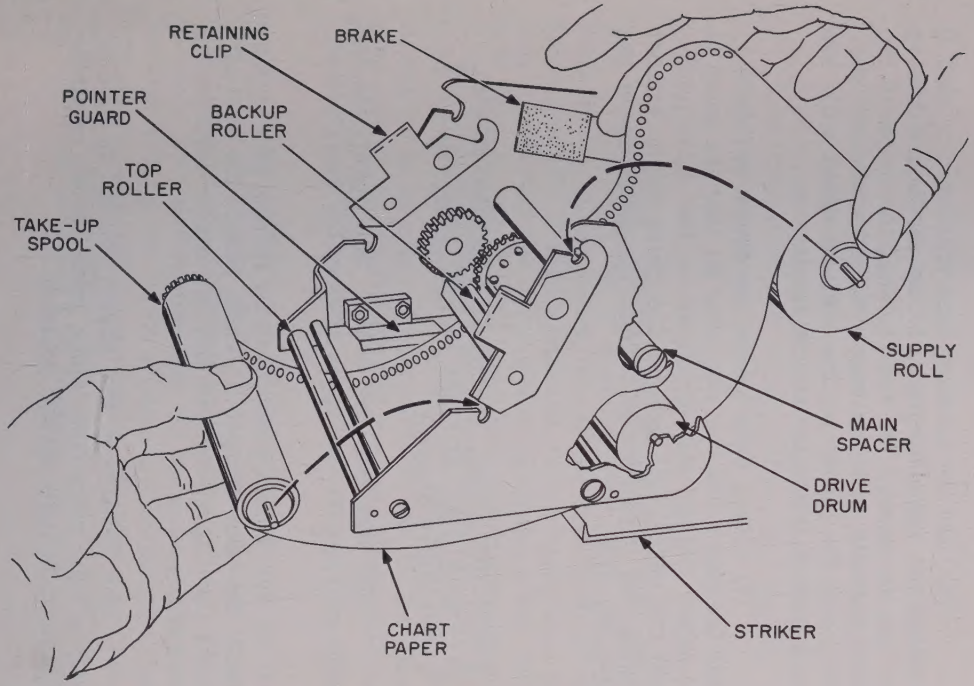

Figure 1. Loading Chart Paper

(6) Use the masking tape (removed in step 4) to attach the end of the paper to the cardboard tube on the take-up spool. Be sure to keep the edges of the paper parallel with the edges of the cardboard tube. Now, roll the paper on the take-up spool with the graph side of the paper visible to you.

(7) Using both hands, as shown in figure 1, slide the paper into the recorder so that the holes in the paper engage the sprockets on the drive drum. Hold the paper taut against the drive drum without tearing the perforations. Keep the paper above the pointer guard.

EXERCISE CARE, IN THESE LOADING STEPS, SO THAT THE STYLUS IS NOT SNAGGED BY THE CHART PAPER.

(8) Depress the brake, and insert the full supply roll into the two upper slots on the metal frame.

(9) Take up any slack by rolling excess paper around the take-up spool. Then, insert the partially loaded take-up spool into the two lower slots on the metal frame.

(10) With both the supply roll and the take-up spool in their respective slots, push the two retaining clips down to their locked position.

Note

This instrument is shipped with a cardboard tube in place over the take-up spool. This tube permits removal of the recording from the take-up spool. When changing chart paper, always remove the cardboard tube from the empty supply roller, and insert the tube onto the take-up spool.

c. COARSE TIMING ADJUSTMENT. (See figure 2.) To set the time of a recording, push the gear train in the direction of the arrow inscribed on its case, and hold it in this position. This disengages the gear train from the drive drum. With the drive drum now free to rotate, pull the chart paper over the top roller until the desired hour (minus two hours) just comes into view on the top roller. For example, if a recording is to begin at 8 o'clock, locate the 6 o'clock time line of the chart paper at the top roller (with the front panel open).

d. FINE TIMING ADJUSTMENT. Check to see that the perforations of the chart paper are still properly engaging the sprockets on the drive drum. Take up slack by rotating the take-up spool in a direction towards the motor. If too much slack exists, the time adjustment will not be accurate. In this case, release drive drum again, and rotate the take-up spool as much as necessary to remove the slack. Then

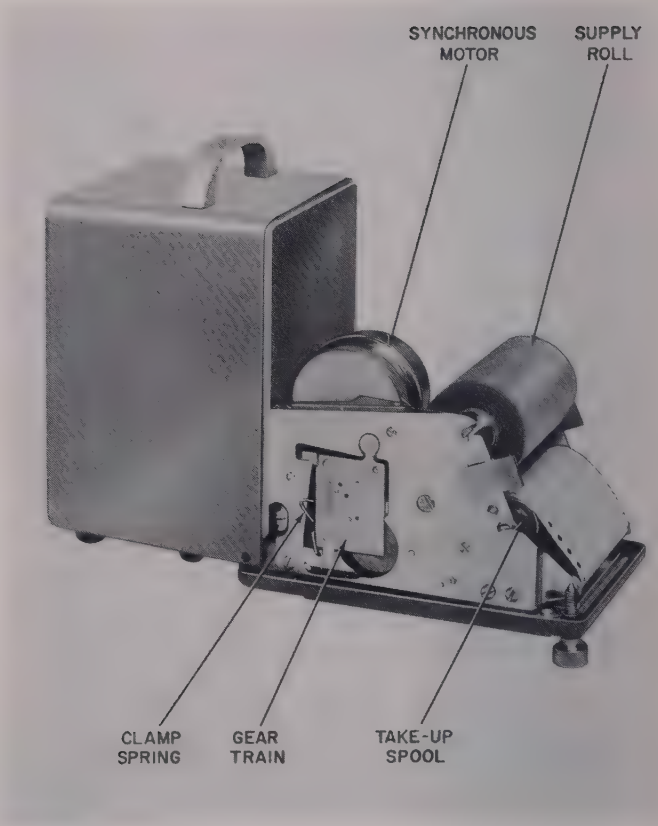

Figure 2. Left Side View of Recorder

check that the desired hour appears directly under the striker, as viewed from the front of the instrument. Make fine adjustments, as necessary. This completes all steps preparatory to use. Apply power and the signal under measurement. No other attention will be necessary, until the paper supply runs out. Check to see that proper operation is taking place approximately 15 minutes after the start of a recording.

4. STYLUS CORRECTION

(See front view illustration.)

The stylus has a zero correction adjustment, which is accessible by removing the plug directly below the Rustrak insignia on the front panel. With the recorder running and no signal applied, use a screwdriver to make the zero adjustment. For highest readout accuracy of the recorder at any given signal level, adjust the stylus with signal applied while monitoring this signal with a precision standard measuring device.

5. REAR NAMEPLATE

The rear nameplate contains all information concerning electrical connections, and the style of Rustrak paper required by the particular recorder.

6. CHART SPEED

a. If the chart speed must be changed for particular applications, extra gear trains covering a wide range of chart speeds are available from your distributor or from the factory.

b. When changing a gear train, remove the clamp spring (figure 2), and take the gear train out by moving it in the direction inscribed on its case. In inserting a new gear train, hold the circular tab in position against the chassis indent. Push the gear to the right so that one tab, in the upper left corner, and one tab, in the middle right section of the case, fall under the cutouts in the metal frame. Insert the spring to lock the gear train in position.

7. READING A RECORDING

Packed with your recorder is an accessory scale identical to the face plate on the instrument. Hold this accessory scale parallel with the horizontal time lines on the chart paper, so that the amplitude of the trace may be quickly referenced.

8. INSTRUMENT MAINTENANCE

The care of the recorder is simple. It requires no lubrication, and will give you years of trouble-free

service. Most importantly, the galvanometer is capable of being overloaded without burnout.

HOWEVER, DO NOT OVERLOAD THE GALVANOMETER BY APPLYING VOLTAGES OR CURRENTS IN EXCESS OF THE FULL-SCALE CALIBRATION, SINCE THIS MAY BEND THE STYLUS SUPPORT AND THROW THE RECORDER OUT OF CALIBRATION. Do not attempt to repair the galvanometer or other major parts; return them to the factory.

9. SERVICE

When trouble develops requiring factory assistance, repack the equipment in a carton equal to the original packaging. Affix a letter giving all details of the trouble to the outside of the package. Forward package to:

Rust Industrial Co., Inc.
130 Silver Street
Manchester, New Hampshire
Attention: Servicing Department

Repr: Fisher Switches
3199 Park Blvd
Palo Alto
Attn: Mr. Kyle
P.O. Box 11548-A

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